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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/745,029	12/20/2000	James E. Amonette	E-1899	8137

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EXAMINER	
ROSENBERGER, RICHARD A	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 12/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/745,029	AMONETTE ET AL.	
	Examin r	Art Unit	
	Richard A Rosenberger	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1,3-9 and 11-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1,3-9,11-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1,3-9, and 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Byatt et al (US 6,161,426) in view of Saunders (US 3,727,049) and Chou (US 6,049,728).

Byatt et al teaches that "[p]hotoacoustic sensors for trace analysis in liquids and, in particular, of oil in water are known" (column 1, lines 40-41); noting that the technique can be used to measure "well into the ppm concentration range" [abstract, lines 11-12], and discusses measuring in the range of less than 40 ppm [column 1, line19], which is within the "less than 0.1%" of the instant claims. Byatt et al teaches, as is otherwise well-known, that photoacoustic measurement "is based on converting optical energy into acoustic energy by means of foreign molecules in liquids" (column 1, lines 45-46). Byatt et al teaches, as is well-known in this art, that in such photoacoustic measurements "the wavelength is selected in such a way that absorption is low in the medium and high in the foreign molecules" (column 1, lines 57-59).

Saunders teaches that it is known in the art to use spectroscopic methods to measure water in oil products such as fuel, see, for instance, column 1, lines 50-58), and teaches light as a wavelength of 2.9 micrometers is absorbed by water and not by the fuel.

The particular application of photoacoustic measurement shown by Byatt et al is measuring oil (as the "foreign molecules") in water (as the "medium"). However, it would have been obvious to use photoacoustic measurements with any foreign molecules in any liquid medium in which light of an appropriate wavelength can be found; Saunders teaches the region around 2.9 micrometers is such a known wavelength. Saunders mentions that there can be in measuring water in oil a problem with scattering of the light in conventional spectroscopic measurements (see column 3, lines 61-67). It is known in the art that photoacoustic measurements as immune form scattering; Chou, for example, teaches that photoacoustic measurements are "relatively immune to turbid conditions" (column 6, lines 47-48), noting "although the incident light may be diffused by scattering mediums . . . the optical absorption process continues as does the photoacoustic generation" (column 6, lines 48-51) so that "the photoacoustic response should remain nearly the same" (column 6, lines 53-54).Thus, given the teaching of Saunders that scattering can be a significant problem in measuring water in oil, those in the art would have been motivated to use a technique, such as a photoacoustic technique, which is known to be insensitive to such scattering. Although not explicitly discussed by the Byatt et

al reference, this is further suggested by that reference, which teaches the use of photoacoustic measurement for oil in water, which, for the same reason that oil and water as immiscible, would be expected to have the same "droplet problem" and light scattering problem recognized and taught by Saunders.

3. The remarks and declaration filed 2 September 2003 have been considered, but have not been found to be persuasive.

As set forth above, the amendment to the claims limiting the concentration to be measured to "less than 0.1%" does not overcome the rejection because in the art, in particular as discussed by Byatt et al, the photoacoustic measurement technique is known to be sensitive and able to measure in the concentration ranges claimed.

The declaration by Dr. Barnes sets forth that the disclosed method is an effective method for detecting water in oil, and that "wet chemistry" techniques have numerous drawbacks. However, the art teaches the use of photoacoustic spectroscopy in the area of analysis of oil and water in a mixture; the record does not present any reason that those in the art would believe that the technique would work to measure oil in water but not water in oil. In both cases the substances are the some, the problems of immiscibility are to same, and the art has an appreciation of particular wavelengths which are absorbed by oil and not by water, which is a general requirement for photoacoustic spectroscopy.

It is relevant to the argument of "long felt need" that the Byatt et al reference is recent. The introduction into the art of new techniques and new applications of existing techniques can render obvious that which may not have been obvious prior to the introduction into the art the new technique or application; thus the solution to what was a long felt need may indeed be obvious once the necessary techniques and understanding to meet that need have entered the art.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Papers related to this application may be submitted to Group 2800 by facsimile transmission. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The fax number is (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to R. A. Rosenberger whose telephone number is (703) 308-4804.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

R. A. Rosenberger
29 November 2003

Richard A. Rosenberger
Primary Examiner